

JAN 10 2007

ATTORNEY DOCKET NO. SD-6533/S93794
SERIAL NO. 09/788,053
PATENT**IN THE CLAIMS**

Following are the current claims. This listing of claims will replace all prior versions, and listings, of claims in the application. For the claims that have **NOT** been amended in this response, any difference between the claims below and the current state of the claims is unintentional and in the nature of a typographical error:

23. (Currently Amended) A method, practiced on a computer, of generating a mesh representation of a region characterized by a trunk and a branch thereon, comprising:
- a) Determining a first trunk mesh;
 - b) Determining a second trunk mesh by adjusting the portion of the first mesh proximal the boundary surface between the trunk and the branch to substantially conform thereto; [and]
 - c) Determining a branch mesh from the portion of the second mesh within said boundary surface and the geometry of the branch[.]; and
 - d) Displaying the mesh representation on a computer screen.
24. (Previously Presented) The method of Claim 23, wherein the trunk comprises a 2½-dimensional region, and wherein determining a first trunk mesh comprises sweeping the volume of the trunk.

ATTORNEY DOCKET NO. SD-6533/S93794
SERIAL NO. 09/788,053
PATENT

25. (Previously Presented) The method of Claim 23, wherein the branch comprises a $2\frac{1}{2}$ -dimensional region, and wherein determining a branch mesh comprises sweeping the volume of the branch.
26. (Previously Presented) The method of Claim 23, wherein determining a second trunk mesh comprises:
- a) Determining the boundary of said boundary surface;
 - b) Determining a 1-dimensional mesh at least twice as fine as the first trunk mesh along said boundary;
 - c) Identifying pairs of nodes of the first trunk mesh defining intersections of the 1- dimensional mesh and the first trunk mesh; and
 - d) Moving a node from each pair to said boundary.
27. (Previously Presented) The method of Claim 26, wherein moving a node comprises determining which node of each pair will, if moved, produce the highest quality mesh elements, and moving that node.
28. (Previously Presented) The method of Claim 26, wherein moving a node comprises determining which node of each pair is closest to the boundary, and moving that node.
29. (Previously Presented) The method of Claim 26, wherein determining a second trunk mesh further comprises determining if the boundary spans the diagonal of

ATTORNEY DOCKET NO. SD-6533/S93794
SERIAL NO. 09/788,053
PATENT

any element of the second trunk mesh after moving nodes to the boundary, and if so, then moving one of the other nodes of said element to the boundary.

30. (Previously Presented) The method of Claim 26, wherein determining a second trunk mesh further comprises smoothing the portion of the first trunk mesh inside the boundary after moving nodes to the boundary.
31. (Previously Presented) The method of Claim 26, wherein determining a second trunk mesh further comprises smoothing the portion of the first trunk mesh outside the boundary after moving nodes to the boundary.
32. (Previously Presented) The method of Claim 26, wherein determining a second trunk mesh further comprises adding a pillow of mesh elements directly inside the boundary.
33. (Previously Presented) The method of Claim 26 wherein determining a second trunk mesh further comprises smoothing the portion of the first trunk mesh beneath the boundary surface after moving nodes to the boundary.
34. (Currently Amended) A method of using a computer to generate a computer-readable mesh representation of a region characterized by a computer-readable representation of a trunk and a computer-readable representation of a branch thereon, comprising:

ATTORNEY DOCKET NO. SD-6533/S93794
SERIAL NO. 09/788,053
PATENT

- a) Determining a first trunk mesh from the computer-readable representation of the trunk;
 - b) Determining a second trunk mesh by adjusting the portion of the first mesh proximal the boundary surface between the trunk and the branch to substantially conform thereto; [and]
 - c) Determining a branch mesh from the portion of the second mesh within said boundary surface and the geometry of the branch[.]; and
 - d) Displaying the computer-readable mesh representation on a computer screen.
35. (Previously Presented) The method of Claim 34, wherein the trunk comprises a 2½-dimensional region, and wherein determining a first trunk mesh comprises sweeping the volume of the trunk.
36. (Previously Presented) The method of Claim 34, wherein the branch comprises a 2½-dimensional region, and wherein determining a graft mesh comprises sweeping the volume of the branch.
37. (Previously Presented) The method of Claim 34, wherein determining a second trunk mesh comprises:
- a) Determining the boundary of said boundary surface;
 - b) Determining a 1-dimensional mesh at least twice as fine as the first trunk mesh along said boundary;

ATTORNEY DOCKET NO. SD-6533/S93794
SERIAL NO. 09/788,053
PATENT

- c) Identifying pairs of nodes of the first trunk mesh defining intersections of the 1- dimensional mesh and the first trunk mesh; and
 - d) Moving a node from each pair to said boundary.
38. (Previously Presented) The method of Claim 37, wherein moving a node comprises determining which node of each pair will, if moved, produce the highest quality mesh elements, and moving that node.
39. (Previously Presented) The method of Claim 37, wherein moving a node comprises determining which node of each pair is closest to the boundary, and moving that node.
40. (Previously Presented) The method of Claim 37, wherein determining a second trunk mesh further comprises determining if the boundary spans the diagonal of any element of the second trunk mesh after moving nodes to the boundary, and if so, then moving one of the other nodes of said element to the boundary.
41. (Previously Presented) The method of Claim 37, wherein determining a second trunk mesh further comprises smoothing the portion of the first trunk mesh inside the boundary after moving nodes to the boundary.

ATTORNEY DOCKET NO. SD-6533/S93794
SERIAL NO. 09/788,053
PATENT

42. (Previously Presented) The method of Claim 37, wherein determining a second trunk mesh further comprises smoothing the portion of the first trunk mesh outside the boundary after moving nodes to the boundary.
43. (Previously Presented) The method of Claim 37, wherein determining a second trunk mesh further comprises adding a pillow of mesh elements directly inside the boundary.
44. (Previously Presented) The method of Claim 37 wherein determining a second trunk mesh further comprises smoothing the portion of the first trunk mesh beneath the boundary surface after moving nodes to the boundary.